



# Air Force Research Laboratory|AFRL

*Science and Technology for Tomorrow's Air and Space Force*

## Success Story

### POWERFUL DIGITAL X-RAY FLAT PANEL DETECTOR AND SOFTWARE TRANSITIONED TO OC-ALC FOR NDI PRODUCTION USE



Digital x-ray flat panel detector technology offers significant advantages over image intensifier systems because it exhibits higher resolution capability due to its enhanced software imaging tools and small size. This improves an inspector's ability to find anomalies in the captured image.



Air Force Research Laboratory  
Wright-Patterson AFB OH

Materials and Manufacturing  
Support to the Warfighter

## Accomplishment

Engineers from the Materials and Manufacturing Directorate and the Aeronautical Enterprise Program Office (AEPO) transitioned a new high-resolution digital X-ray flat panel detector system and its image processing software to Oklahoma City Air Logistics Center's (OC-ALC) Advanced Composite Repair Center Real-time X-ray Inspection Facility. Funded by AEPO, OC-ALC non-destructive inspection (NDI) personnel will use this detector system for real-time and static radiographic production inspections of B-1, KC-135, E-3 horizontal and vertical flight control surfaces and B-1 structural control vanes. This system provides image archiving capability, enhanced performance, improved productivity, and best of all, higher resolution and sensitivity than previous digital detector systems.

## Background

NDI inspections are important because they eliminate the need for unnecessary maintenance and aircraft disassembly, which are time-intensive and can potentially create additional damage and problems in these Air Force systems. These inspections also pinpoint specific locations requiring maintenance actions. Therefore, better NDI systems can yield huge maintenance and cost savings for the Air Force.

X-ray radiography is an important NDI technique used to evaluate parts and assemblies for integrity during aircraft component manufacturing. Inspectors also use X-ray inspection in the maintenance of aging aircraft to inspect structures and honeycomb cores for damage, internal moisture, corrosion, and to evaluate intricate internal geometries in turbine engine components for cracking and inclusions.

Under a contract with AEPO and the directorate's Nondestructive Evaluation Branch, Marietta X-ray, Inc. (MXRI) evaluated and assessed the performance of various commercial off-the-shelf hardware and software systems from several X-ray detector platforms using aircraft components. MXRI evaluated the General Electric (GE) DXR-250RT flat-panel detector system and GE Radworks 5.1 imaging software and selected them to meet the inspection requirements of OC-ALC.

The system's transition also marks the completion of the third phase of the Digital Radiography Insertion Program (DRIP). The DRIP program focuses on transitioning digital radiography technology to address specific Air Force depot applications and improve NDI depot production capabilities and productivity.

## Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-ML-30)